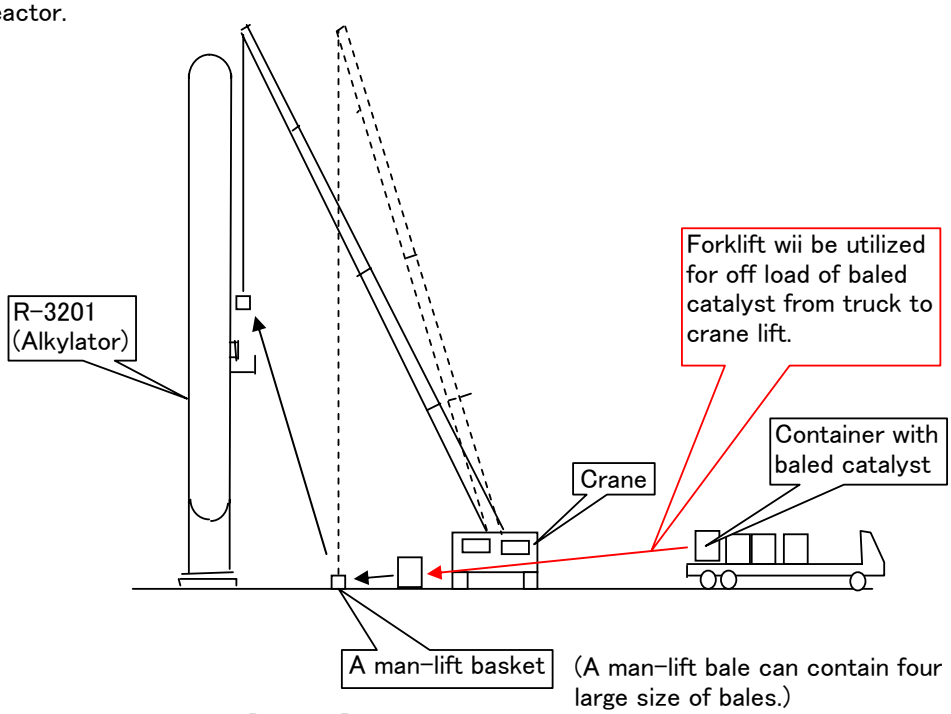
ATTACHMENT-4 (1/2)
Loading of Catalyst in Alkylator (R-3201)

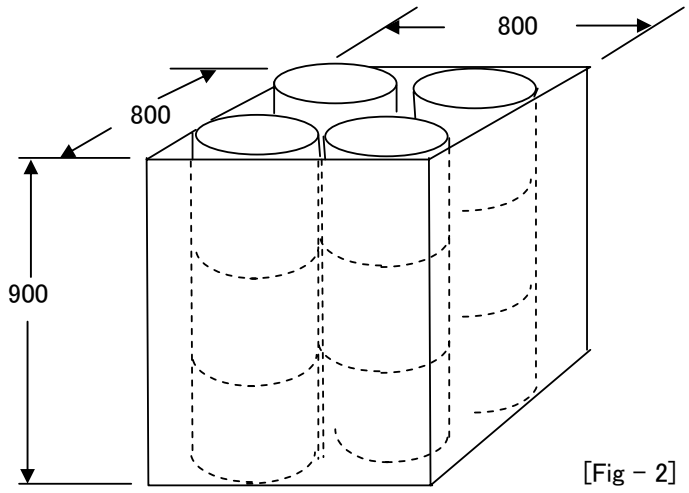
Re: JCP-TM-GY/JY-1824

1. Baled catalyst is transported to the place adjacent to the Alkylator as shown below.
2. Each container is lifted up from the trailer truck and put it on the ground. Bales out of container are passed to the man-lift basket which can contain 12 pieces of large bales, as shown in Fig -2. In case of large bales, the total bales weight is 156 kg.

   0.0227 m^3 x 12 x 575 kg/m^3 = 156 kg per a man-lift basket (Bulk density: 510 - 575 kg/m^3)
3. A man-lift basket is lifted to the platform in front of a manhole by a crane.
4. A person staying on the platform, receives a man-lift basket.from the crane. Then, he/she unloads bales from the basket. About ten (10) man-lift baskets are prepared for this job to save time.
5. A person staying at the platform in front of manway, hand a bale over to a person working inside of the reactor.


R-3201
(Alkylator)
Forklift wii be utilized for off load of baled catalyst from truck to crane lift.
Container with baled catalyst
Crane
A man-lift basket
(A man-lift bale can contain four large size of bales.)

[Fig - 1]



[Fig - 2]

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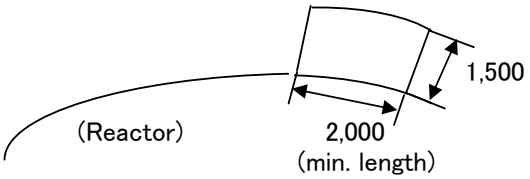
ATTACHMENT-4 (1/2)
Loading of Catalyst in Alkylator (R-3201)

Re: JCP-TM-GY/JY-1824

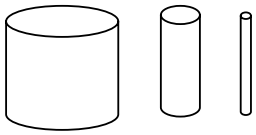
6. Size of platform
For easy handling of catalyst, 1.5 m wide x 2.0 m long platform is to be provided in front of each manhole.



[Fig -3]

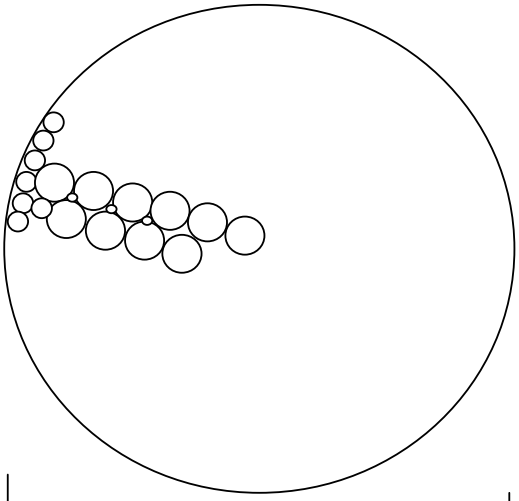
7. A peson staying at outside of the reactor hand each bale over to a person working inside.
There are three different sizes of bales:

(1) 305 mmϕ x 305 mm H for Large Bale
(2) 100 mmϕ x 305 mm H for Small Bale
(3) 50 mmϕ x 305 mm H for Mini Bale

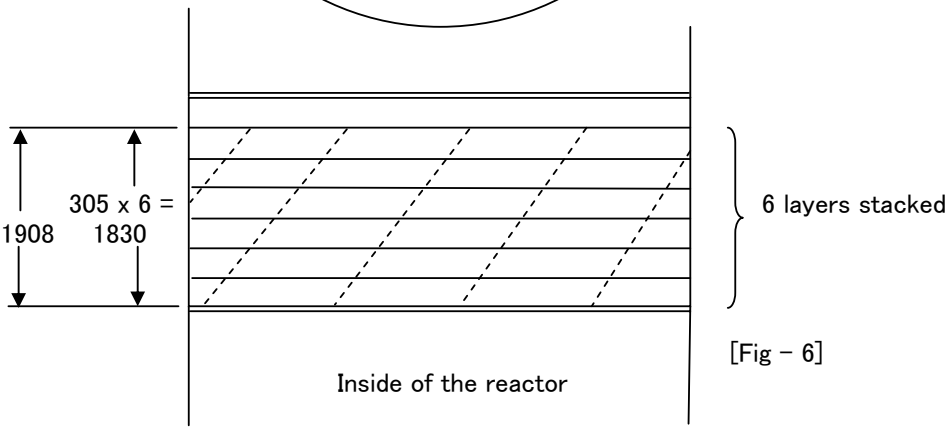


[Fig - 4]

8. A typical loading pattern is shown below:



[Fig - 5]



[Fig - 6]

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ATTACHMENT-4 (1/2)
Loading of Catalyst in Alkylator (R-3201)

Re: JCP-TM-GY/JY-1824

9. Lifting speed
The lifting speed : 93 m/min for high speed and 43 m/min for normal speed
Therefore, it will take about 2 min for one cycle operation – from lifting from the ground to returning to the ground, including unloading a bales basket.

10. Installation procedures are shown as the following pictures, indicating several steps.

First Step

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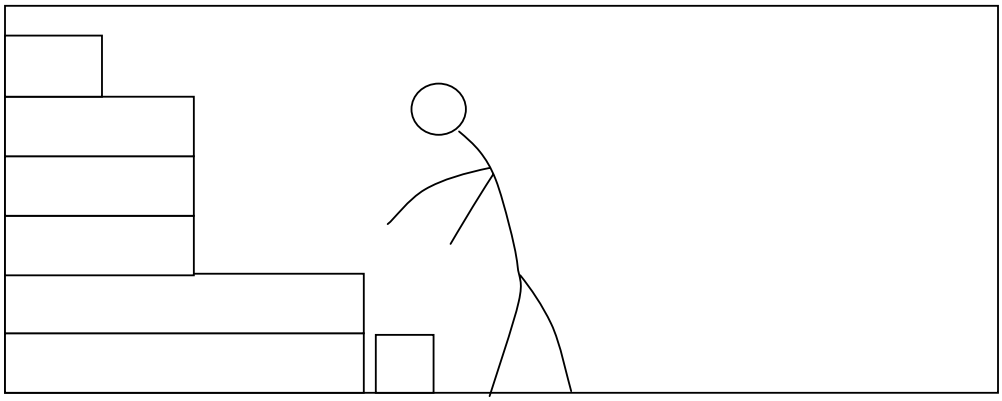
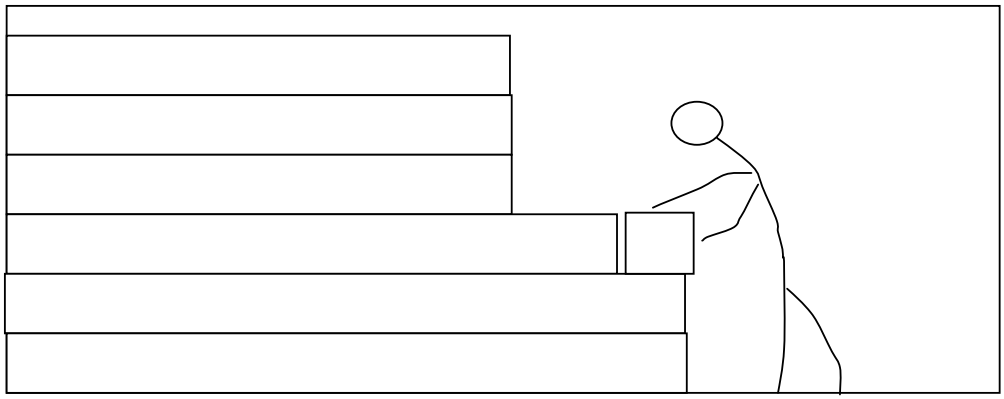
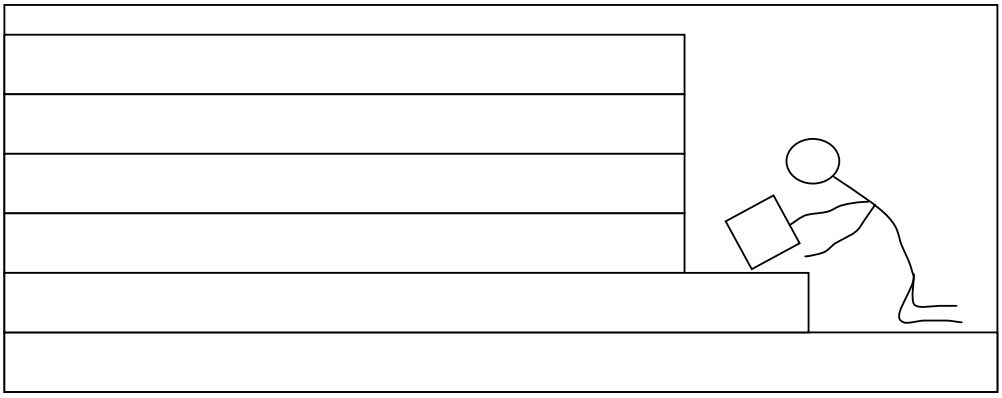


Second Step



Third Step



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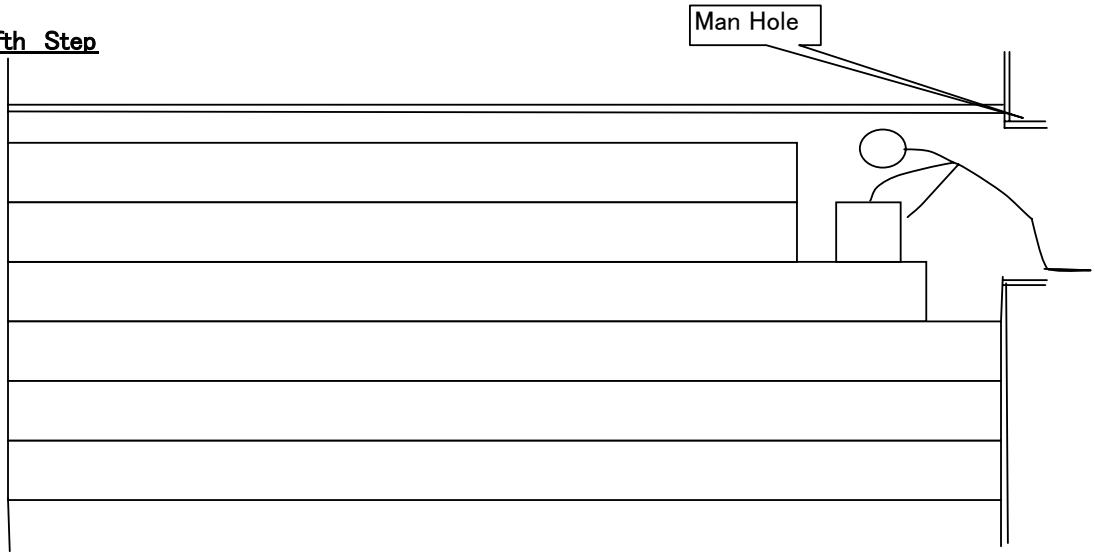
ATTACHMENT-4 (1/2)
Loading of Catalyst in Alkylator (R-3201)

Re: JCP-TM-GY/JY-1824

Fourth Step

Fifth Step



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ATTACHMENT-4 (2/2)
Unloading of Catalyst from Alkylator (R-3201)

Re: JCP-TM-GY/JY-1824

The basic steps of the procedure are:

Step 1: Liquid Draining
Drain the liquid in the reactor

Step 2: Depressurizing
Vaporize imbedded organics by depressurizing to about 0.35 kg/cm^{2}g
The reactor bed temperature is reduced to about 50 ℃.

Step 3: Hot Purging with Steam (only for catalyst regeneration case)
Purge with low pressure steam to reduce benzene content in the existing steam to below 10 wppm
(If the catalyst is to be reused without regeneration, purge with nitrogen alone.)

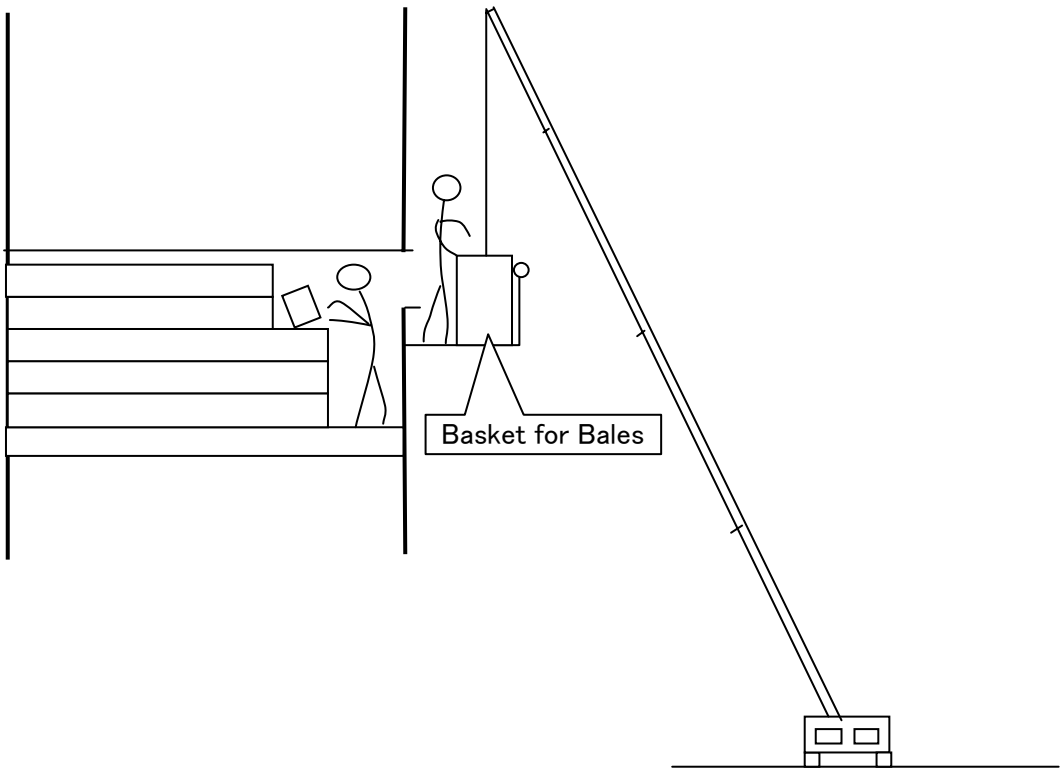
Step 4: Hot Purging with Nitrogen
Purge with nitrogen to confirm that all hydrocarbons have been removed and steam displaced from the beds.
The final benzene concentration of the existing gas is less than 1 vppm.

Step 5: Cooling of Nitrogen
Purge with nitrogen until reactor internal temperature is about 35 ℃ to 50 ℃.

Step 6: Displacement of Nitrogen
The nitrogen must be displaced with fresh air before entry is permitted.

1. Once the reactor has been purged of hydrocarbons and cooled as explained the above, a person may enter the tower and begin handing out bales one-by-one to a co-worker located on the platform.
2. Spent bales are lowered to grade using a basket lifted by a crane as shown the below.

Alkylator (R-3201)



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